

**CLAIMS**

1. Use of cycloglycans having a ring-shaped base structure of 2 to 40 monosaccharides in the ring, which is unsubstituted or may be derivatized at the monosaccharides forming said ring, by one or more monosaccharides(s) or disaccharide(s) and/or one or more functional group(s), wherein the total number of the monosaccharides making up the molecule of the cycloglycans is 2 to 250, and said cycloglycans may also be bound to an inert carrier or may be immobilized thereon, for reducing or preventing the invasion and infection of mammalian cells by pathogens, and for combating diseases caused by such pathogens.
2. Use according to claim 1, characterized in that the cycloglycans are homopolymeric cycloglycans and/or the ring of the cycloglycans is made up of 6 to 40, and in particular 6 to 20 monosaccharides.
3. Use according to claim 1 or 2, characterized in that the ring of the cycloglycans is made up of D-fructose, D-mannose, L-fucose, D-N-acetyl glucosamine, D-N-acetyl galactosamine, D-xylose, sialic acids, L-rhamnose, D-arabinose, D-allose, D-talose, L-idose, D-ribose, D-galacturonic acid, altrose, D-galactose and glucoses.
4. Use according to any one of the preceding claims, characterized in that one, two or all of the following criteria are met:
- i) the cycloglycans are derivatized at one or more of the monosaccharides forming the ring by one or more of the following monosaccharide groups bound thereto in a glycosidic linkage: D-

fructose, D-mannose, L-fucose, D-N-acetyl glucosamine, D-N-acetyl galactosamine, D-xylose, sialic acids, L-rhamnose, D-arabinose, D-allose, D-talose, L-idose, D-ribose, D-galacturonic acid, altrose, D-galactose and glucoses;

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- ii) the cycloglycans are derivatized at one or more of the monosaccharides forming the ring, by one or more of the following disaccharide groups bound thereto in a glycosidic linkage: lactose, maltose, sucrose and galacto-N-acetyl glucosamine;

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- iii) one or more of the OH groups of one or more of the monosaccharides forming the ring is or are substituted by an NH<sub>2</sub> group, SH group, phosphate group, sulfate group, nitrate group, alkyl group, hydroxyalkyl group or carboxyalkyl group.

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- iv) one or more of the OH groups as well as of the - if present - NH<sub>2</sub> and SH groups of the monosaccharides forming the ring are derivatized in the form of ethers, esters, amides and imines.

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5. Use according to any one of the preceding claims, characterized in that the linkage of the monosaccharides in the ring is  $\alpha$ -glycosidic or  $\beta$ -glycosidic, with the  $\beta$ -glycosidically linked monosaccharides in particular being periplasmic glycans.

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6. Use according to any one of the preceding claims, characterized in that the cycloglycans have 6, 7 or 8 monosaccharides and in particular glucose units in the ring.

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7. Use according to claim 1,

characterized in that  
the cycloglycans are the following:  
 $\alpha$ -cyclodextrin,  $\beta$ -cyclodextrin,  $\gamma$ -cyclodextrin; cyclofructines,  
cyclomannines, cyclogalactines and cycloaltrines, which may be  
derivatized in the manner described in claim 4.

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8. Use according to claim 7,  
characterized in that  
the derivatized cycloglycans are glucosyl- $\alpha$ -cyclodextrins, maltosyl- $\beta$ -  
cyclodextrins and hydroxypropyl cyclodextrins.

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9. Use according to any one of the preceding claims,  
characterized in that  
the carrier is a peptide, a protein, a lipid, a lipoid, a polymer or a  
biopolymer.

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10. Use according to any one of the preceding claims,  
characterized in that  
the cycloglycans are incorporated into a fluid or solid food composition, a  
dietetic composition or a pharmaceutical composition for administration to  
a human or an animal, or serve for preparing such a composition.

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11. Use according to claim 10,  
characterized in that  
the composition serves for an oral, lingual, nasal, bronchial, vaginal,  
topical (skin and mucosa) and *per os* administration, for an administration  
by means of a probe into the stomach of a human or an animal, or for an  
administration as an infusion.

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30 12. Use according to any one of the preceding claims,  
characterized in that

the cycloglycans are administered once daily in an amount of at least 1 mg per kg of body weight to a human or an animal.

- 5 13. Use according to any one of the preceding claims,  
for the prevention and treatment of infections of the gastrointestinal tract,  
blood system, respiratory passages, urogenital tract, as well as the  
nasopharynx, in particular in case of listerioses.
- 10 14. Use according to any one of the preceding claims,  
c h a r a c t e r i z e d in that  
the pathogens are invasive gram-positive and gram-negative pathogenic  
bacteria, in particular listeria, and pathogenic viruses.
- 15 15. Food composition, dietetic composition and pharmaceutical composition  
containing a cycloglycan described in any one of claims 1 through 9, or  
several such cycloglycans.
- 20 16. Composition according to claim 15,  
c h a r a c t e r i z e d in that  
it may contain a further carbohydrate or more further carbohydrates, which  
are not a cycloglycan as described in claim 1, a further active agent or  
several further active agents and/or a further ingredient, which is known  
and suited for the corresponding composition, or more of such ingredients,  
wherein in the case of a pharmaceutical composition a usual auxiliary  
25 agent or several usual auxiliary agents, including diluents, moisturizing  
agents, thickening agents, flavoring agents, sweetening agents and  
carriers, may be present.
- 30 17. Method of reducing or preventing the invasion and infection of mammal  
cells by pathogens, and of combating diseases in humans and animals  
caused by such pathogens,

characterized in that

at least one cycloglycan according to any one of claims 1 through 9 or a composition according to claim 15 or 16 is administered to a human or an animal, in particular in such an amount that at least 1 mg of cycloglycan per kg of body weight is supplied to the human or the animal once daily.

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18. Cycloglycans having a ring-shaped base structure of 2 to 40 monosaccharides in the ring, which is unsubstituted or may be derivatized at the monosaccharides forming said ring, by one or more monosaccharide(s) or disaccharide(s) and/or one or more functional group(s), wherein the total number of the monosaccharides making up the molecule of the cycloglycans is 2 to 250, and said cycloglycans may also be bound to an inert carrier or immobilized thereon, for reducing or preventing the invasion and infection of mammalian cells by pathogens, and for combating diseases caused by such pathogens.

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